

Case History: Core Sand Regeneration (BULGARIA)



Project Requirement: The customer's production process produces a 7 ton/hour flow of spent sand and core butts coming from a cylinder head casting facility. Rather than buying new sand, this volume of spent sand needs to be completely regenerated and recycled for use in the core making process.

Our Solution: Fata Aluminum supplied a complete regeneration system, including all the sand preparation and handling equipment upstream of the seven (7) ton/hour thermal regeneration furnace.

Scope of work:

The complete system includes also the preliminary sand preparation area, tailored to an approximate maximum capacity of nine (9) tons/hour. Sand preparation includes breaking down core butts and sand accretions into sand granules of a maximum two millimeter (2mm) size. This spent sand is stored in a dedicated spent sand silo until it is thermally regenerated in an Eco Rec furnace. The furnace is equipped with an external heat exchanger to recover kilocalories from furnace exhaust and use them to pre-heat fluidization air while also cooling the exhaust to safe levels before it reaches the dust collector filter. Finally, the regenerated sand is cooled down to ambient temperature and stored in a dedicated silo.

An additional cooling and duct removal unit is placed after the final regenerated sand silo and before the storage hopper of the core shooting machine. This system uses air/cold water fluidized bed technology to cool the sand to a proper temperature with the aid of a dedicated water chiller. The drop in temperature is obtained by indirect heat exchange between fluidized sand and chilled water. In addition, the fluidized bed is used to remove dust from the sand just before it is used in the core shop.

The FATA Aluminum Scope of Supply includes both the closed loop water cooling system, and the dust exhaust system drawing dirty air from any area of the system that requires it.

The regenerated sand, when delivered to the core shooting machines, has a maximum L.O.I. of 0.1%, and a fines content lower than 0.5%.